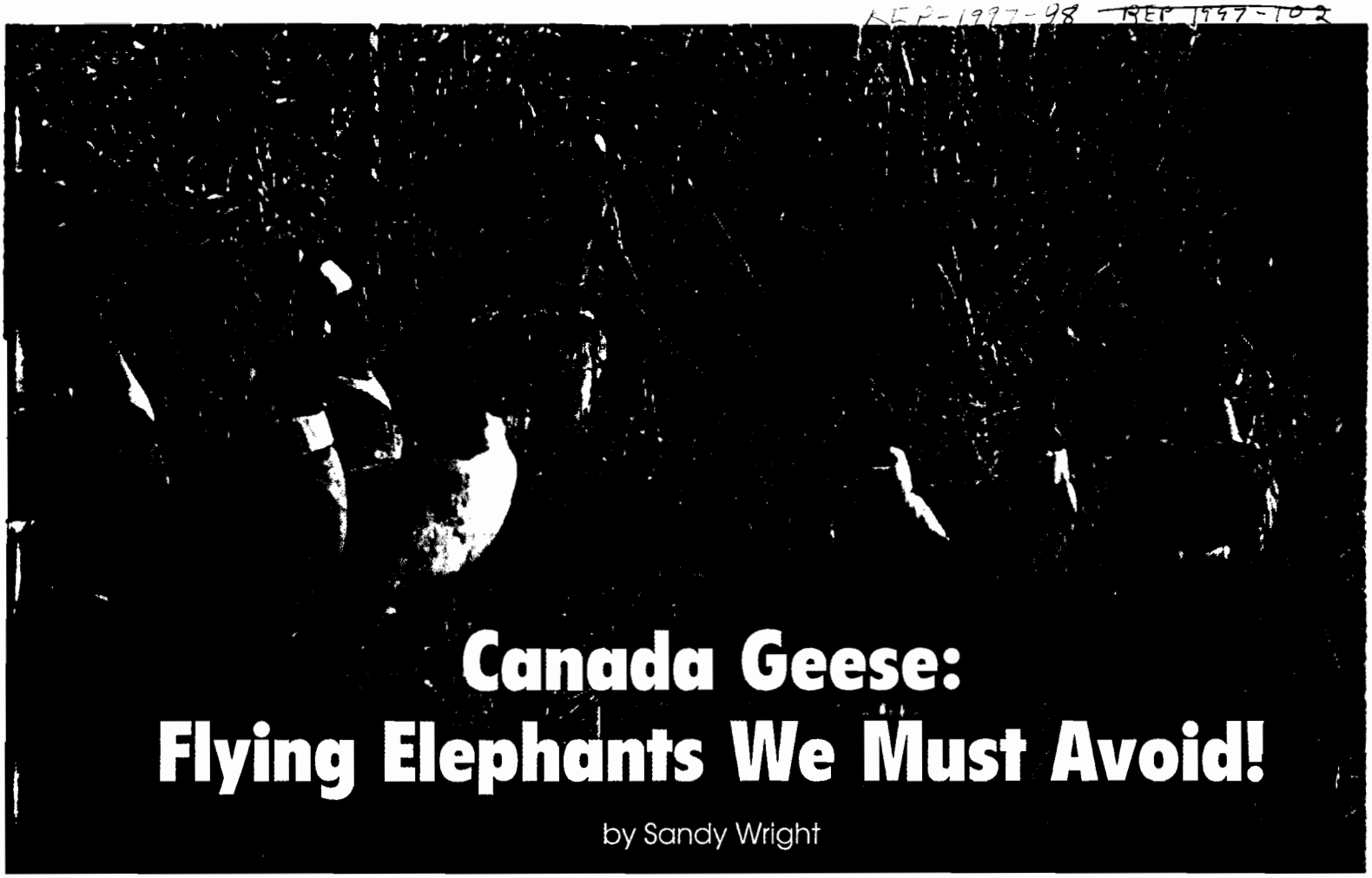

Canada Geese: Flying Elephants We Must Avoid!

by Sandy Wright

Canada geese in holding area at National Wildlife Research Center in Sandusky, OH. They will be released after the goose repellent tests are completed. (S. Wright photo)

INTRODUCTION

A flock of Canada geese honk as they pass overhead in their familiar "V" formation. Many of us would be stirred by this sight. However, if you are a pilot who had a run-in with one of those eight to 12-pound birds, you might see them in a different light. Each year an average of 60 goose strikes is reported to the FAA, but in all probability, there are another 240 that are not reported, based on FAA statistics. Most goose strike reports (66%) do not identify the species. Canada geese, snow geese, and brant represent 92%, seven percent, and one percent of the strikes that are identified to species.

BIOLOGY

The Canada goose is distinguished from other geese by its black neck and head with a white cheek patch. The body feathers are gray-brown to dark brown. Because there are several subspecies, it is impossible to give an exact weight but they range in size from three to 12 pounds. Their life span is about eight years. Geese are monogamous and work together to raise their young. The usual hatch is about five young. In late June and early July, the adults are unable to fly because they are molting, and the young have not acquired their flight feathers. But by late July, all the family can fly, and they congregate in large flocks and move to open areas where there is abundant food. Geese are attracted to airports because of the grassy expanses devoid of trees and shrubs. They feed on tender grass, clover, and grains.

POPULATIONS ON THE RISE

Canada geese are among the most numerous and diverse of all waterfowl species in North America. The non-migratory population has increased from about 0.2 million to 1.8 million (800%) since 1970 (Figure 1). The number of Canada geese migrating through North America has increased from 1.8 to 3 million (67%) since 1970 (Figure 2). The winter distribution of these migratory geese has changed over the last 40 years because of wildlife management practices of providing food for the geese throughout the winter. Now many flocks are remaining in northern areas in winter, and the migration patterns are not as clear as they once were. These increasing populations of migratory, and especially non-migratory geese, coupled with the growth in air travel, both commercial and private, set the stage for a greater chance of collisions between aircraft and geese.

DEVASTATING AND COSTLY STRIKES

Nearly 50% of all strikes with geese involve some degree of damage and at least 24% have an effect on the flight. A few high profile accidents in the United States have recently brought

attention to this growing problem. In June 1995, a *Concorde*, on final approach to JFK International Airport, struck several geese which destroyed two engines. No one was injured, but the damage totaled about $6 million. Three months later, in September, an Airbus 320 struck Canada geese at La Guardia. The repair bill along with loss of revenue came to over $2.5 million. In December 1995, a B-747, on approach to JFK International, had an expensive goose strike. Snow geese destroyed two engines and damaged the airframe to the tune of $6 million. The crew said if felt like the aircraft was being struck by sandbags.

The most devastating strike with Canada geese to date happened at Elmendorf Air Force Base (Alaska) in September 1995. Twenty-four military personnel were killed when their E-3 AWAC aircraft (a modified Boeing 707) crashed after striking a flock of Canada geese on takeoff. Along with the tragic loss of lives, a staggering cost of $189 million was incurred. A few days later, in Michigan, U.S. House Speaker Newt Gingrich's plane struck geese on take-off. There were no injuries, but the aircraft overran the runway during the aborted take-off.

THE FORCE OF AN ELEPHANT

Large birds are the greatest threat to aircraft because the force of the impact is affected by the bird's weight and the speed of the aircraft. Geese can weigh as much as 12 pounds. According to Transport Canada, the impact of a goose striking a jet can be equal to 1.5 million foot pounds of energy, a force equal to that of an African elephant stampeding over a parked car. Most of today's commercial airliner jet engines can withstand the shock of a one and a half pound bird, and the newest airliner jet engines have been designed to take a two and a half pound bird without failing. Aircraft frames and engines are not built to withstand striking a single goose let alone a large number of geese at high speed.

AVOIDING GOOSE STRIKES

In order to avoid damaging strikes you should be aware of when and where these strikes are likely to occur. The worst months seem to be March (14%) and August through November (45%) (Figure 3). The most likely phase of flight for strikes is approach (40.2%). Light conditions seem to favor day/dawn at 46%. Goose strikes have been reported in 42 states. Illinois had more goose strikes than any other (8.7%), followed closely by Connecticut (8.3%) and California (8.0%). The northeastern part of the U.S. seems to be heavily represented with four states and the District of Columbia equaling 30% of the total goose strikes reported. More strikes occur on the runway (altitude 0) than any other altitude. If you observe geese on or near the runway be extremely cautious. Request that the geese be cleared from the runway area and do not land or take off until they are gone.

Inspecting engine damage from a goose strike. (R. Dolbeer photo)

WHAT IS BEING DONE TO CONTROL GEESE?

Scare Tactics

Presently, complex Federal and State responsibilities are involved with Canada goose control activities. All actions, except harassment, require a Federal permit and in most cases a state permit is also required. Wildlife Services (WS) biologists from the U.S. Department of Agriculture are assisting airport managers with the management of geese in the vicinity of airports.

Your strike reports help bring this problem to their attention. For example, an airport in Missouri had a strike reported when a twin engine aircraft received damage to one wing when it struck a goose. WS biologists found 300 geese feeding in crops adjacent to the runway. The geese were harassed with pyrotechnics, and some were removed.

Sometimes geese can be discouraged from taking up residence by the use of noise making devices such as shell crackers—special shells fired from a 12-gauge shotgun that project a firecracker up to 125 yards—and auto-exploders which produce a sound similar to that of a shotgun and which can be set up to go off automatically. Distress calls are also played to frighten the geese away. After a while,

the geese become used to scare tactics and are not affected by them.

Relocation and Removal

Geese are sometimes removed from the site and relocated to a more desirable area. Officials at Washington National and Washington Dulles International airports were unable to completely remove geese by harassment techniques. WS, with the assistance of the Virginia Department of Agriculture, obtained the necessary permits, captured 1,098 resident geese during the summer molt when the birds were flightless, and relocated them to the Tidewater region of Virginia.

A close up of an engine damaged by Canada geese. (R. Dolbeer photo)

Habitat Management

Habitat management is another way to prevent unwanted species from using airport grounds. Research has shown that geese tend to avoid areas where the grass height is over four inches. Taller grass height, combined with an active harassment program, should dramatically reduce a goose population.

In 1996, the National Wildlife Research Center studied the effect of lime applied to grass as a deterrent to geese and found that it was an effective repellent. More studies are planned to determine the minimum effective concentrations of lime on turf and agricultural crops.

Recognizing the threat posed to aircraft by wildlife, the FAA is curtailing the growing of crops on airport prop-

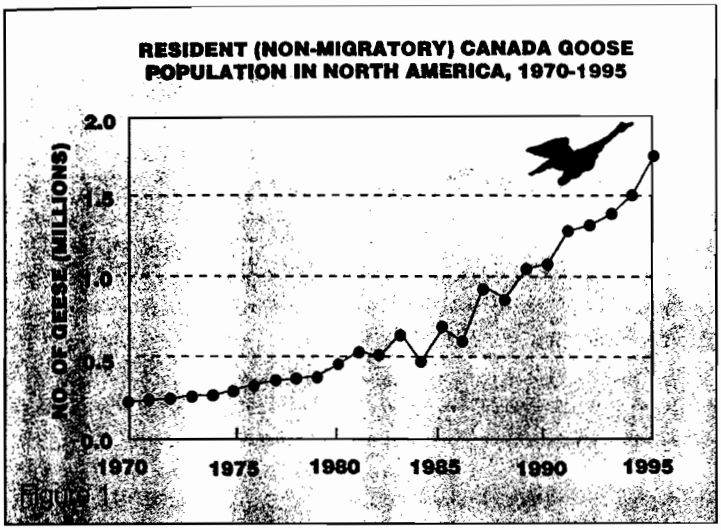

Figure 1

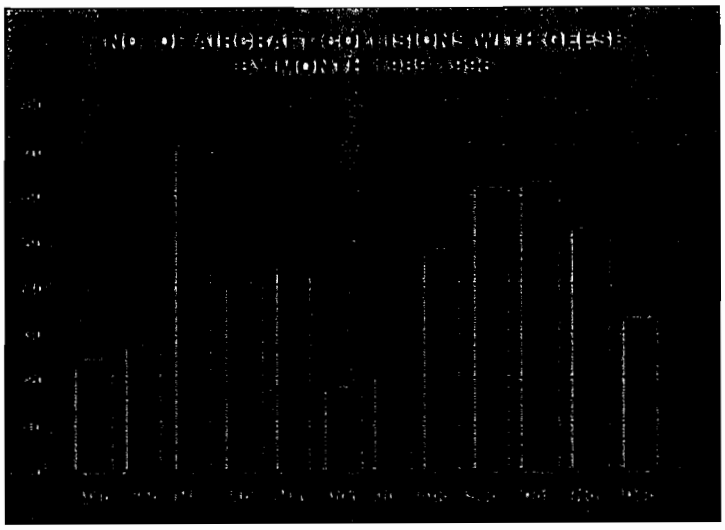
Figure 3

erty. Unfortunately this is being met with opposition by some airport managers who think that it is futile since "birds will be around regardless of what they do." However, other managers, including a former military B-52 pilot, support the FAA saying, "I know what a goose can do to an engine. When I was in the military, farming operations were not allowed around military fields."

REPORT ALL STRIKES

Wildlife strike reporting is critical to managing this serious problem because the accuracy of FAA analyses and the ability to provide appropriate recommendations are limited by data availability. When you file a wildlife strike report, it is entered into the FAA Wildlife Strike Database. The FAA estimates that less than 20% of all strikes are reported. If airport managers and wildlife biologists are to control the bird strike problem they must have accurate data on which to base their actions. These data come from FAA Form 5200-7 "Bird/Other Wildlife Strike Report" which was updated this year and is available from local Flight Standards District Offices, airports, and can be found in your AIM, Appendix I. Copies of FAA form 5200-7 are available on the Internet at www.faa.gov/arp/topics.htm. From there, find "Bird Hazards" and you'll see "Bird Strike Report." Please take a few minutes to help build an important database, even if you sustained no damage or injury. In many instances, the pilot provides the strike information to the tower personnel who then file the 5200-7 report with the FAA. The information is not used in a punitive way but is combined with all other reports to give a better picture of what is going on with wildlife in and around airports and the economic and safety impact these strikes have.

Remember, elephants can't fly, but an aircraft strike with a Canada goose can make you believe they do!

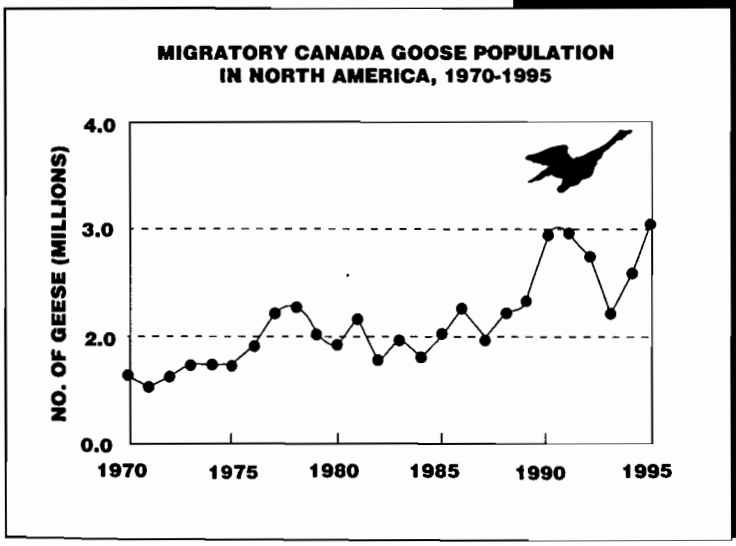

Figure 2

QUICK FACTS

- Resident/non-migratory goose populations tripled from 1985-1995.
- Goose collisions with aircraft have doubled since 1990.
- Most strikes occur during the day.
- More than twice as many strikes occur during approach than during climb.
- Almost 20% of the strikes cause substantial damage; over half cause some type of damage.
- March and October are the worst months for strikes.
- Twenty five percent of strikes affect the flight negatively.
- The most expensive goose strike cost $189 million.
- The deadliest goose strike took the lives of 24 Air Force crew.

Data in the following tables are for all goose strikes reported to the FAA Wildlife Strike database. Most goose strike reports (66%) do not identify the species. Canada geese, snow geese, and brant represent 92%, 7% and 1% of the strikes that are identified to species.

State	No. of Reported Strikes	% of Strikes
IL	45	8.7
CT	43	8.3
CA	41	8.0
PA	37	7.2
NY	31	6.0
NJ	27	5.2
WA	24	4.7
OH	20	3.9
DC	19	3.7
MN	18	3.5

Table 1. Top 10 states for goose strikes, 1989-April 1997

Time of Day	No of Reported Strikes	% of Strikes
Dawn	13	2.5
Day	224	43.5
Dusk	41	8.0
Night	168	32.6
Not reported	69	13.4
TOTAL	515	

Table 2. Number of aircraft collisions with geese by time of day, 1989 - April 1997

Year	No. of Reported Strikes	% of Reported Strikes
1989	[illegible]	8.2
1990	[illegible]	7.8
1991	[illegible]	9.2
1992	[illegible]	[illegible]
1993	[illegible]	[illegible]
1994	[illegible]	[illegible]
1995	[illegible]	[illegible]
1996	[illegible]	[illegible]
TOTAL	[illegible]	

Table 3. Number of aircraft [illegible] with geese [illegible] 1989-1996

Extent of Damage	No. of Incidents	% of Incidents
Destroyed	0	0
Substantial	·95	18.4
Minor	135	26.2
Unknown damage	27	5.2
None	195	37.9
Unknown	63	12.2
TOTAL	515	

Table 4. Type of damage to aircraft, 1989 - April 1997

TIPS FOR AVOIDING BIRD STRIKES

- Avoid areas where there are concentrations of birds (marshes, lakes, rivers and protected wildlife areas).
- When approaching nontowered airports, fly over the airport to check for wildlife.
- Check NOTAM's for bird activity near airports and take appropriate precautions.
- Keep shatterproof goggles or glasses in the cockpit and use them when flying in or out of airports where birds congregate.
- When at low altitudes or approaching an area where bird encounters are likely, slow the aircraft as much as practical. The impact energy increases with the square of the velocity.
- If you encounter a flock of birds, try to stay above them as their first instinct is to dive.
- Some pilots believe your illuminated landing lights enable the birds to see you sooner.
- Use the windshield defroster in cold weather. A warm [illegible]
- Report birds to the tower or warn other pilots in the [illegible] nontowered fields.

Author's Note: I would like to thank the following people for their [illegible] providing support for this article: [illegible]

[illegible] Wright is employed by the U.S. [illegible] of Agriculture [illegible] National Wildlife Research Center [illegible] Ohio. [illegible] the FAA Wildlife Strike Database [illegible] reported wildlife strikes to aircraft since 1989 and [illegible] about 2,300 strikes per year.